



FROEHLING & ROBERTSON, INC.

Engineering Stability Since 1881

310 Hubert Street
Raleigh, North Carolina 27603-2302
T 919.828.3441 | F 919.828.5751
NC License #F-0266

October 16, 2017 (revised February 5, 2018)

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Gordon Box, L.G.
GeoEnvironmental Project Manager

Re: State Project: R-2530B
WBS Element: 34446.1.6
NC 24-27 from Bird Road in Albemarle to West of the Pee Dee River

Subject: Preliminary Site Assessment
Parcel #056 – June Allen (Custom Accessories)
2331 East Main Street
Albemarle, North Carolina
F&R Project #66V-0092


Dear Mr. Box:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the June Allen property located in Albemarle, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017). Notice to Proceed was issued to F&R on July 6, 2017. This report documents our field activities, presents the results of laboratory analysis and provides estimated quantities of petroleum impacted soils.

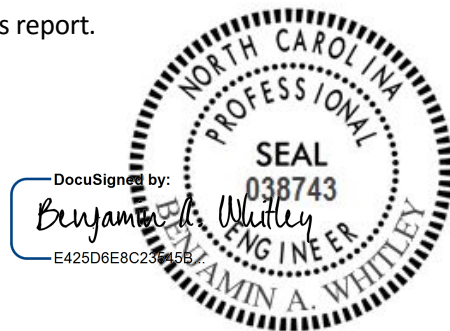
Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

DocuSigned by:

4DB7F275EBFD410...

Clint E. Sorrell
Environmental Scientist



Benjamin A. Whitley, P.E.
GeoEnvironmental Services Manager



PRELIMINARY SITE ASSESSMENT

**June Allen (Parcel #056)
Custom Accessories
2331 East Main Street
Albemarle, North Carolina
State Project: R-2530B
WBS Element: 34446.1.6
F&R Project #66V-0092**

October 16, 2017 (revised February 5, 2018)

Prepared for:

**North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610**



TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1
2.0 GEOPHYSICAL SURVEY.....	1
3.0 SITE ASSESSMENT ACTIVITIES	2
4.0 SUBSURFACE CONDITIONS	3
5.0 ANALYTICAL RESULTS	3
6.0 CONCLUSIONS AND RECOMMENDATIONS.....	4
7.0 LIMITATIONS.....	5
APPENDIX I	FIGURE No. 1 – Topographic Map FIGURE No. 2 – Site Vicinity Map FIGURE No. 3 – Laboratory Results & Boring Location Plan
APPENDIX II	GEOPHYSICAL REPORT PREPARED BY PYRAMID
APPENDIX III	SITE PHOTOS
APPENDIX IV	GEOPROBE LOGS
APPENDIX V	LABORATORY ANALYTICAL RESULTS



**Preliminary Site Assessment Report
June Allen Property (Parcel #056)
Albemarle, Stanly County, North Carolina
F&R Project No. 66V-0092**

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment (PSA) Report to document soil assessment activities performed at the June Allen Property addressed as 2311 East Main Street, in Albemarle, Stanly County, North Carolina. The site is located approximately 190 feet east of Anderson Grove Church Road as shown in Appendix I, Figures 1 and 2. As indicated in the Request for Technical and Cost Proposal (RFTCP), the site operates as an existing automotive detail shop (Custom Accessories - Albemarle). According to the NCDEQ UST Section Registry, no USTs are registered for the site. The RFTCP indicates the site may have operated as a gas station or repair shop based on the architectural style of the building.

According to the NCDOT within their RFTCP, acquisition of right-of-way is necessary for the proposed NC24-27 design. As such, the NCDOT requested a PSA be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs, and to locate USTs which may exist within proposed easements and right-of-way at the project site.

The PSA was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017) with Notice to Proceed issued to F&R by the NCDOT on July 6, 2017. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide estimated quantities of petroleum impacted soils.

The existing on-site structure is one-story in height and is constructed of concrete masonry unit (CMU) block. The remainder of the site consists of a gravel parking lot and cleared land. The site is bordered to the north by cleared and wooded land; to the south by East Main Street; to the east by Tillery Housing Center; and to the west by a cemetery. Access to the site is gained from East Main Street to the south.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Pyramid Environmental & Engineering, P.C. (Pyramid) conducted a geophysical survey to locate suspect metal underground storage tanks (USTs). The geophysical work was conducted from July 21 to July 24, 2017, and was performed within the proposed right-of-way and proposed drainage and utility easements of East Main Street.



The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61 instrument. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were investigated using a Geophysical Survey Systems UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. The EM61 data was collected along parallel survey lines spaced approximately 5 feet apart. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review. Isolated EM anomalies were identified on the site, including metal posts, a water line, suspected utilities, and a suspected vent pipe. In addition, one probable metallic UST was identified approximately 55 feet southeast of the on-site structure. The GPR data suggest that the top of the probable UST is approximately 2 feet below ground surface (bgs). Pyramid estimated the probable UST is 5 feet in diameter and 9 feet long, which is approximately 1,300 gallons in size. The GPR survey also indicated a vent pipe extended from the UST to the building.

Based on the EM and GPR geophysical data collected at the site, Pyramid observed one anomaly that was interpreted to be the results of a probable metallic UST. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

F&R visited the site on August 15, 2017 to perform the Preliminary Site Assessment. The assessment consisted of advancing 8 borings into the soils at the project site using direct-push technology (GeoProbe). The boring locations were determined by F&R staff based on the results of the geophysical survey, site features and proposed construction activities. Four of the borings (B-1 through B-4) were advanced on the southwestern portion of the site adjacent to East Main Street. Borings B-5 through B-8 were advanced on the southeastern portion of the site adjacent to the probable metallic UST. F&R attempted to advance the borings adjacent to East Main Street (B-1 through B-3) to the proposed depth of 10 feet below ground surface (bgs) and the borings around the UST to the proposed depth of 12 feet bgs. However, Borings B-1 through B-4 were terminated at a depth ranging from 6.5 feet bgs (B-1) to 8 feet bgs (B-4) and borings B-5 through B-8 were terminated at depths ranging from 6 to 10 feet bgs, where GeoProbe refusal was encountered. Photos detailing existing site features are attached as Appendix III and boring locations are depicted in Figure 3 of this report.

Soil sample cores from the borings were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a calibrated photo-ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC



concentrations were performed using a MiniRae 3000 PID which produces results in parts per million (ppm). A representative soil sample was collected from two foot sections of each sleeve and placed in a re-sealable plastic bag. The vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID measurements can be found in the GeoProbe Logs in Appendix IV, as well as in Table 1 in Section 5.0 below.

Generally, the soil sample in each boring which exhibited the highest PID concentration was submitted for laboratory analysis for diesel range organics (DRO), gasoline range organics (GRO), Total BTEX (benzene, toluene, ethylbenzene and xylenes), 16 PAHs (polycyclic aromatic hydrocarbons) and BaP (Benzo(a)pyrene) by Ultraviolet Fluorescence (UVF) technology (RedLab QED Hydrocarbon Analyzer).

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and shipped via UPS to RedLab in Wilmington, North Carolina following standard chain-of custody procedures.

4.0 Subsurface Conditions

As indicated in the attached GeoProbe Logs (Appendix IV), subsurface conditions from existing ground surface to boring termination primarily included various layers of dry-moist, red-orange-brown-gray silty sandy clay, dry-moist, red-brown-tan silty clay with stone, and dry tan silt with stone. F&R attempted to advance the borings adjacent to East Main Street (B-1 through B-3) to the proposed depth of 10 feet below ground surface (bgs) and the borings around the UST to the proposed depth of 12 feet bgs. However, Borings B-1 through B-4 were terminated at a depth ranging from 6.5 feet bgs (B-1) to 8 feet bgs (B-4) and borings B-5 through B-8 were terminated at depths ranging from 6 to 10 feet bgs, where GeoProbe refusal was encountered in interbedded layers of dense silt and stone.

PID readings generally did not exceed 5.8 ppm, and petroleum odors and/or groundwater were not observed during field screening or sample collection activities.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons identified as GRO were not encountered in the seven soil samples obtained from the site. Petroleum hydrocarbons identified as DRO were also not encountered in the seven soil samples obtained from the site.



Table 1
Soil Sampling Analytical Results

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)	Total BTEX (mg/kg)	Total Aromatics (mg/kg)	16 EPA PAHs (mg/kg)	BaP (mg/kg)
B-1	8/15/17	2-4	5.0	<0.35	<0.35	<0.35	<0.35	<0.07	<0.11	<0.014
B-2		6-7	5.4	<1	<1	<1	<1	<0.21	<0.34	<0.042
B-3		2-4	4.7	<0.51	<0.51	<0.51	<0.51	<0.1	<0.16	<0.021
B-4		2-4	5.8	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023
B-5		2-4	4.5	<0.53	<0.53	<0.53	<0.53	<0.11	<0.17	<0.021
B-6		4-6	1.0	<0.54	<0.54	<0.54	<0.54	<0.11	<0.17	<0.022
B-7		6-7	3.9	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.024
B-8		6-8	4.8	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011
NCDEQ Action Level				50	100	NSE	13.8056	NSE	9,068.816	0.088

Concentrations shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ, DWM, UST Section Guidelines

ppm = parts per million

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

TPH = Total Petroleum Hydrocarbons

BTEX = Benzene, Toluene, Ethylbenzene and Xylenes

NSE = No Standard Exists

6.0 Conclusions and Recommendations

F&R conducted a PSA at the June Allen Property addressed as 2311 East Main Street, in Albemarle, Stanly County, North Carolina. A geophysical investigation was performed by Pyramid Environmental & Engineering to investigate the presence and location of USTs in the proposed right-of-way. Based on the results of the geophysical survey, it was determined that one probable metallic UST was present approximately 55 feet southeast of the on-site building. F&R recommends that USTs removed from the project site be properly managed and disposed of in accordance with NCDEQ rules and regulations.

Eight GeoProbe borings were advanced during the assessment within the proposed right-of-way, where grading activities and storm drain utilities are proposed in association with the NC 24-27 improvements. Based on the results of laboratory testing and observed PID readings, petroleum impacted soils were not found at concentrations above the NCDEQ Action Levels at the project site.



It should be noted that a delineation of the soil contamination was not performed, as this was not included in the proposed scope of work. The above conclusions are based on interpretations of soil analytical results, PID readings and our experience with petroleum UST releases.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.

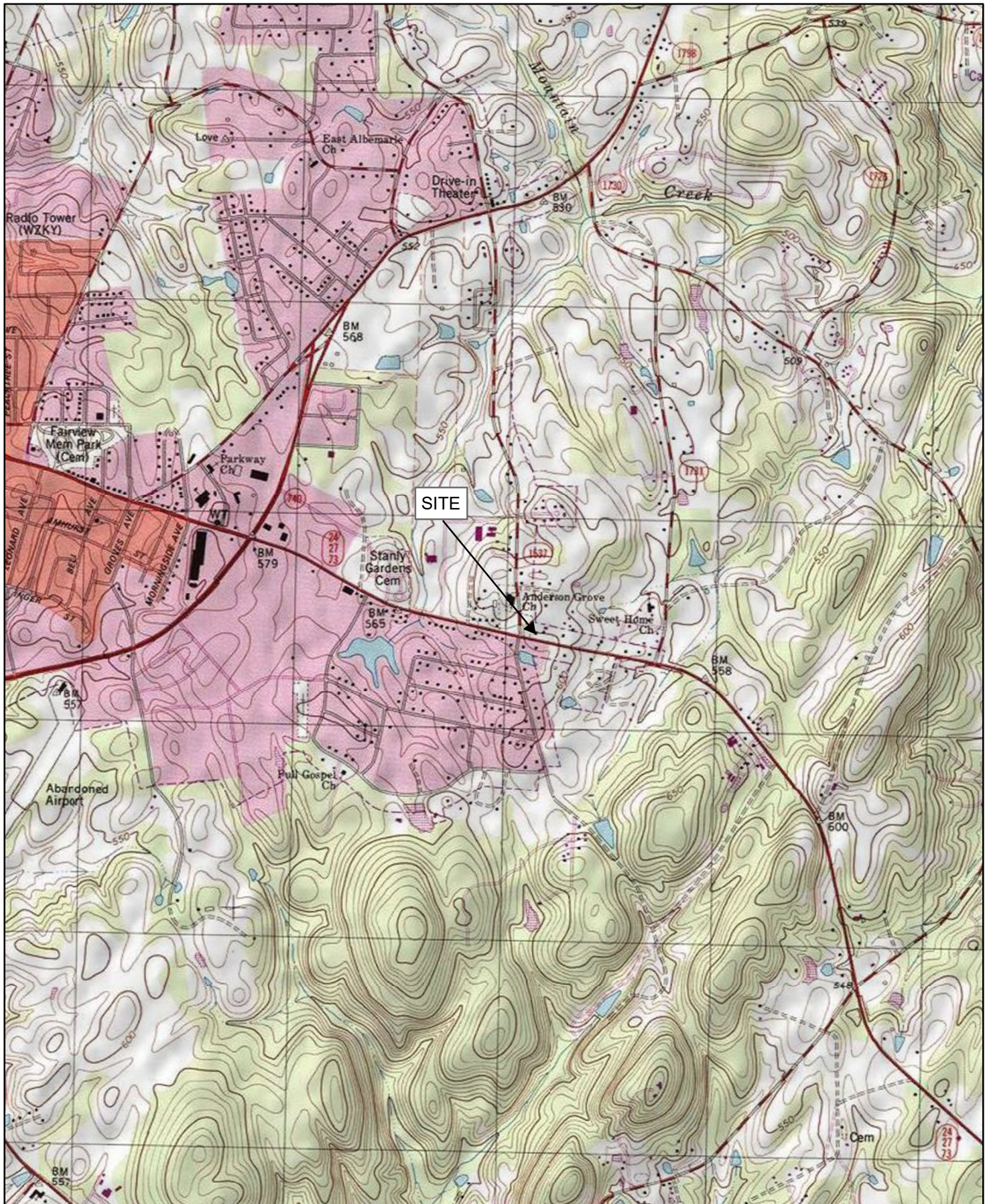


APPENDIX I

Figure No. 1 – TOPOGRAPHIC MAP

Figure No. 2 – SITE VICINITY MAP

Figure No. 3 – LABORATORY RESULTS & BORING LOCATION PLAN



SITE TOPOGRAPHIC MAP

0 1,000 2,000 4,000 6,000 Feet



FROEHLING & ROBERTSON, INC.

Engineering Stability Since 1881

310 Hubert Street

Raleigh, North Carolina 27603-2302 | USA

T 919.828.3441 | F 919.828.5751

Client: NCDOT

Project: R-2530B PSAs

Location: Parcel #056, Albemarle, NC

F&R Project No.: 66V-0092

Date: USGS 2013

Date: October 2017 (Revised Feb. 5, 2018)

2331 East Main Street - Albemarle, North Carolina

Scale: 1:24,000 1 inch = 2,000 feet

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

FIGURE
No.: 1



SITE VICINITY MAP

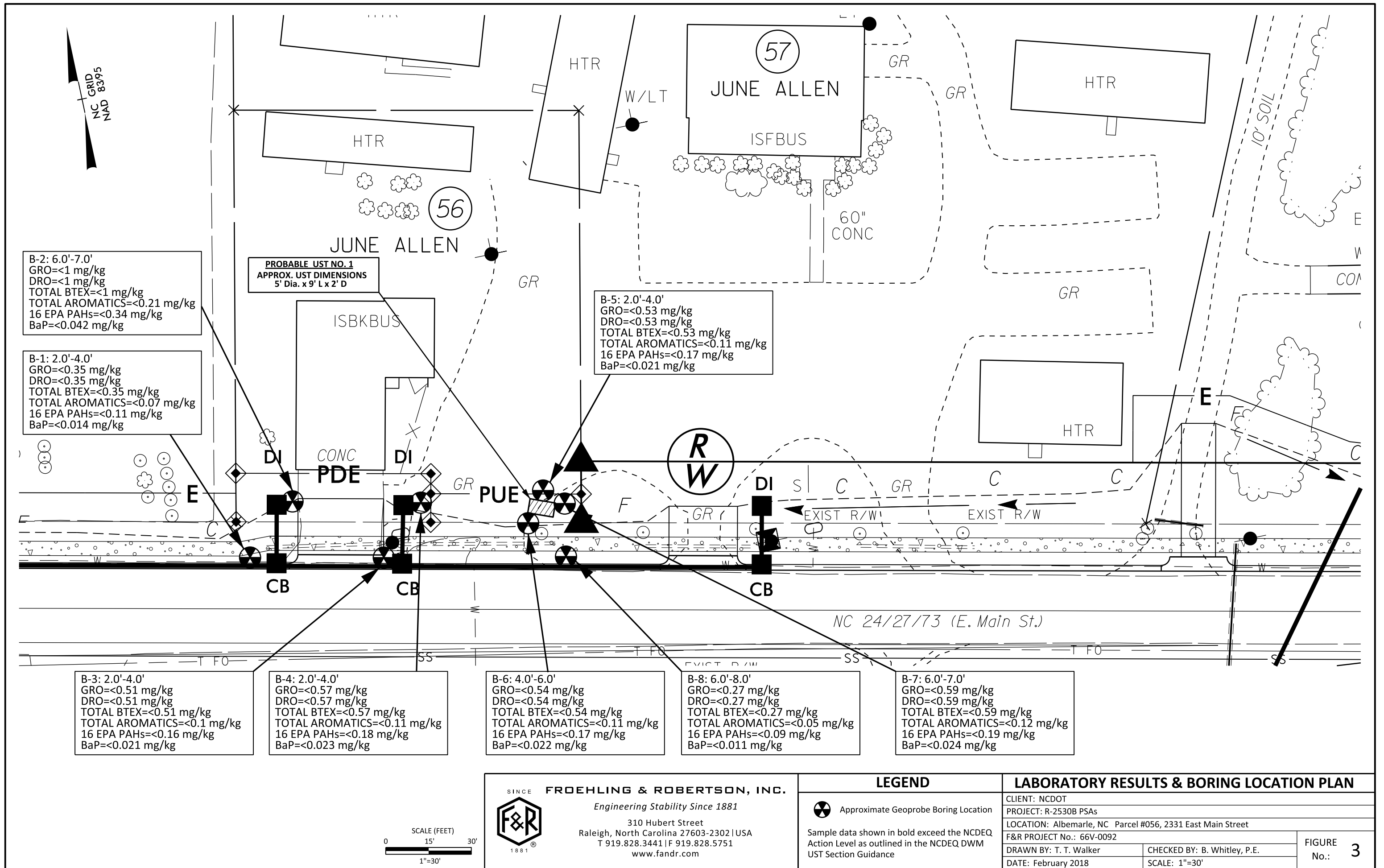
0 100 200 400 600 Feet



FROEHLING & ROBERTSON, INC.
 Engineering Stability Since 1881
 310 Hubert Street
 Raleigh, North Carolina 27603-2302 | USA
 T 919.828.3441 | F 919.828.5751

Client:	NCDOT	Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.
Project:	R-2530B PSAs	
Location:	Parcel #056, Albemarle, NC	2331 East Main Street - Albemarle, North Carolina
F&R Project No.:	66V-0092	
Data:	ArcMap Imagery	Scale: 1:2,400 1 inch = 200 feet
Date:	October 2017 (Revised Feb. 5, 2018)	

FIGURE
 No.: 2





APPENDIX II

GEOPHYSICAL REPORT PREPARED BY PYRAMID




PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2017-203)


GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 056 NCDOT PROJECT R-2530B

2331 E. MAIN STREET, ALBEMARLE, NC
SEPTEMBER 1, 2017

Report prepared for: Benjamin Whitley, P.E.
Froehling and Robertson
310 Hubert Street
Raleigh, North Carolina 27603

Prepared by: 
Eric C. Cross, P.G.
NC License #2181

Reviewed by: 
Douglas A. Canavella, P.G.
NC License #1066

GEOPHYSICAL INVESTIGATION REPORT
Parcel 056 – 2331 E. Main Street
Albemarle, Stanly County, North Carolina

Table of Contents

Executive Summary	1
Introduction.....	2
Field Methodology.....	2
Discussion of Results.....	3
Summary and Conclusions	5
Limitations	6

Figures

- Figure 1 – Parcel 056 Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 056 EM61 Results Contour Map
- Figure 3 – Parcel 056 GPR Transect Locations and Images
- Figure 4 – Parcel 056 Location and Size of Probable UST
- Figure 5 – Overlay of Geophysical Survey Boundaries and Location of Probable UST on
NCDOT Engineering Plans

LIST OF ACRONYMS

CADD	Computer Assisted Drafting and Design
DF	Dual Frequency
EM.....	Electromagnetic
GPR.....	Ground Penetrating Radar
GPS	Global Positioning System
NCDOT.....	North Carolina Department of Transportation
ROW	Right-of-Way
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 056, located at 2331 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from July 21-24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of five EM anomalies were identified. One EM feature on the west side of the shed was associated with unknown buried metal, and was investigated further by GPR. Additionally, multiple EM features suspected to be associated with buried utilities and a possible vent pipe were investigated by GPR.

GPR provided evidence of an isolated hyperbolic reflector and discrete lateral reflector that are characteristic of a UST on the west side of the shed. The combined geophysical data resulted in this feature being classified as one probable metallic UST (center point 1656863.15, 582515.64 North Carolina State Plane NAD83, feet). The probable metallic UST was approximately 9 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface. GPR also verified the presence of a vent pipe extending from the probable UST to the building, as well as multiple buried utilities and possible buried debris.

Collectively, the geophysical data recorded evidence of one probable metallic UST at Parcel 056.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 056, located at 2331 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from July 21-24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building and shed surrounded by a gravel parking area and grass medians. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 14.0 software programs.

GPR data were acquired across select EM anomalies on July 24, 2017, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks on NCDOT Projects			
High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	Probable UST Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	Possible UST Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Metal posts	
2	Water line	✓
3	Suspected utility	✓
4	Suspected vent pipe	✓
5	One probable UST	✓

Several of the EM anomalies were directly attributed to visible cultural features including metal posts and a water line (based on utility markings). However, one high-amplitude EM feature was observed on the west side of the shed structure (Anomaly 5) that was associated with unknown buried metal. This feature was investigated further by GPR. Additionally, EM features suspected to be associated with buried utilities (Anomalies 2 and 3) as well as a feature suspected to be associated with a possible vent pipe (Anomaly 4) were investigated with GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, as well as the transect images. A total of six GPR transects were performed at the site. GPR Transects 1-2 were performed across Anomaly 5 on the west side of the shed. These transects showed an isolated hyperbolic reflector and a discreet lateral reflector that are characteristic of a metal UST. The combined EM and GPR data result in this feature being classified as one probable UST (center point 1656863.15, 582515.64 North Carolina State Plane NAD83, feet). The probable UST was approximately 9 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface. **Figure 4** presents the location of the probable UST on an aerial photograph along with a ground-level photograph.

GPR Transect 3 recorded an isolated hyperbolic reflector characteristic of a buried metal pipe. The pipe was observed to extend from the probable UST to a vent pipe protruding

from the ground on the east side of the building. This feature is interpreted to be the vent pipe for the probable UST.

The remaining GPR transects verified multiple utilities crossing through the remaining EM features, as well as possible buried debris. No evidence of additional unknown USTs was observed.

Collectively, the geophysical data recorded evidence of one probable metallic UST at Parcel 056.

Figure 5 provides the location of the probable UST and an overlay of the geophysical survey area onto the NCDOT MicroStation engineering plans (proposed ROW and easements) for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 056 in Albemarle, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- One EM feature on the west side of the shed was associated with unknown buried metal, and was investigated further by GPR. Additionally, multiple EM features suspected to be associated with buried utilities and a possible vent pipe were investigated by GPR.
- GPR provided evidence of an isolated hyperbolic reflector and discreet lateral reflector that are characteristic of a UST on the west side of the shed. The combined geophysical data resulted in this feature being classified as one probable metallic UST (center point 1656863.15, 582515.64 North Carolina State Plane NAD83, feet).
- The probable metallic UST was approximately 9 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface.

- GPR also verified the presence of a vent pipe extending from the probable UST to the building, as well as multiple buried utilities and possible buried debris.
- Collectively, the geophysical data recorded evidence of one probable metallic UST at Parcel 056.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for F&R in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.




APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area
(Facing Approximately Northeast)



View of Survey Area
(Facing Approximately East)

TITLE PARCEL 056 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS		
PROJECT PARCEL 056 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B		
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE	8/24/2017	CLIENT FROEHLING & ROBERTSON
PYRAMID PROJECT #:	2017-203	FIGURE 1

N ↑

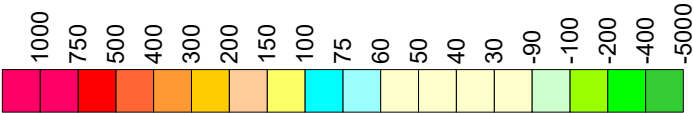
EM61 METAL DETECTION RESULTS




EVIDENCE OF ONE PROBABLE METALLIC UST OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on July 21, 2017, using a Geonics EM61 instrument. Verification GPR data were collected on July 24, 2017, using a GSSI UtilityScan DF unit with a dual frequency 300/800 MHz antenna.

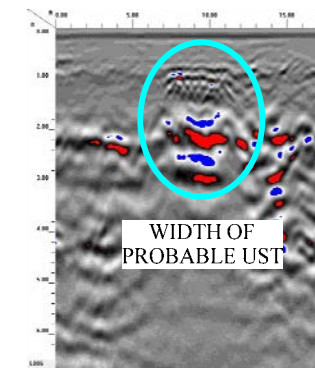
EM61 Metal Detection Response (millivolts)



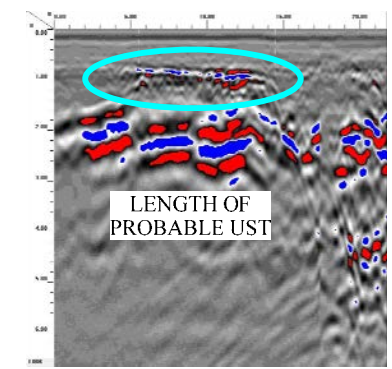
TITLE PARCEL 056 - EM61 RESULTS CONTOUR MAP		
PROJECT PARCEL 056 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B		
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE	8/24/2017	CLIENT FROEHLING & ROBERTSON
PYRAMID PROJECT #:	2017-203	FIGURE 2

N↑

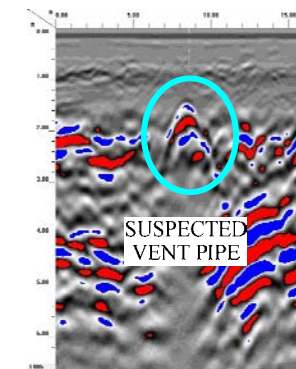
GPR TRANSECT LOCATIONS



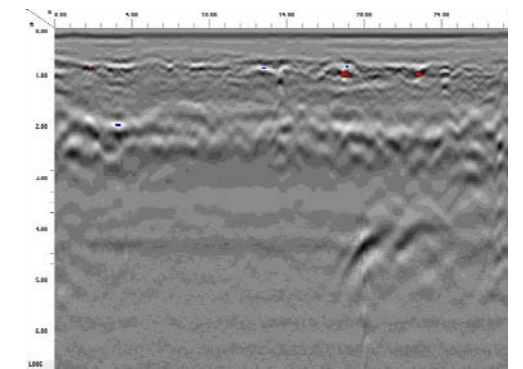
GPR TRANSECT 1 (T1)



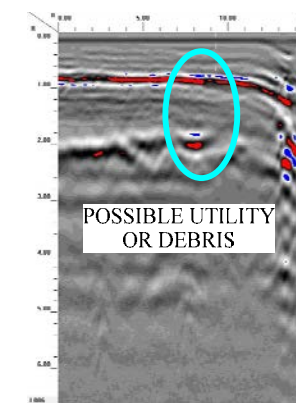
GPR TRANSECT 2 (T2)



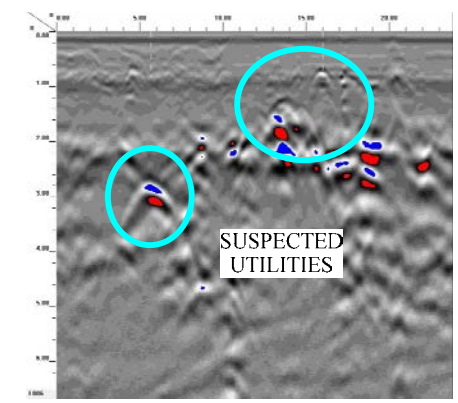
GPR TRANSECT 3 (T3)




GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)

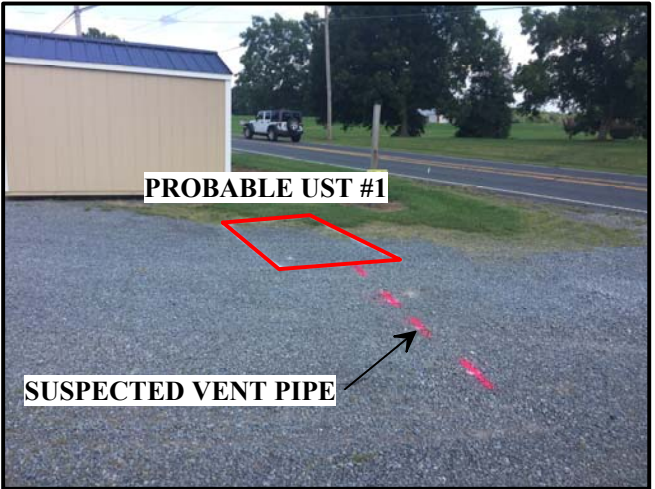


GPR TRANSECT 6 (T6)


TITLE		PARCEL 056 - GPR TRANSECT LOCATIONS AND IMAGES	
PROJECT		PARCEL 056 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	8/24/2017	CLIENT FROEHLING & ROBERTSON	
PYRAMID PROJECT #:	2017-203	FIGURE 3	

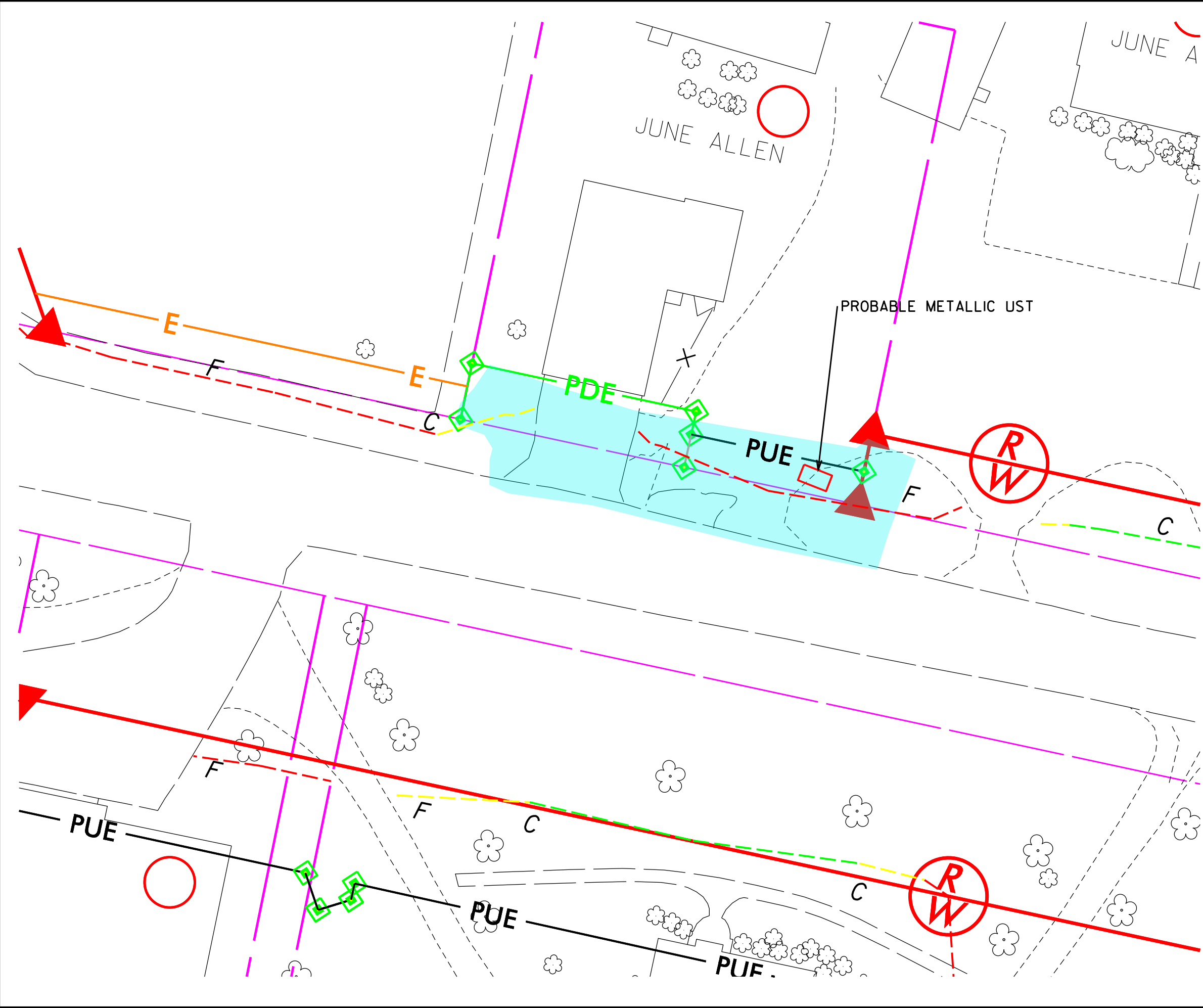
N ↑

LOCATION OF PROBABLE METALLIC UST



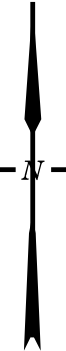
View of Probable UST #1
Facing Approximately East


TITLE		PARCEL 056 - LOCATION AND SIZE OF PROBABLE UST	
PROJECT		PARCEL 056 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	8/3/2017	CLIENT FROEHLING & ROBERTSON	
PYRAMID PROJECT #:	2017-203	FIGURE 4	



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT DRAINAGE
- PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA
- PROBABLE METALLIC UST



TITLE OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES AND LOCATION OF PROBABLE UST ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 56 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 8-24-17	REVISION NO. 0
PYRAMID PROJECT NO. 2017-203	FIGURE NO. 5



APPENDIX III

SITE PHOTOS



Photo #1: Boring locations B-1 and B-2, facing east.



Photo #2: Boring locations B-3 and B-4, facing west.

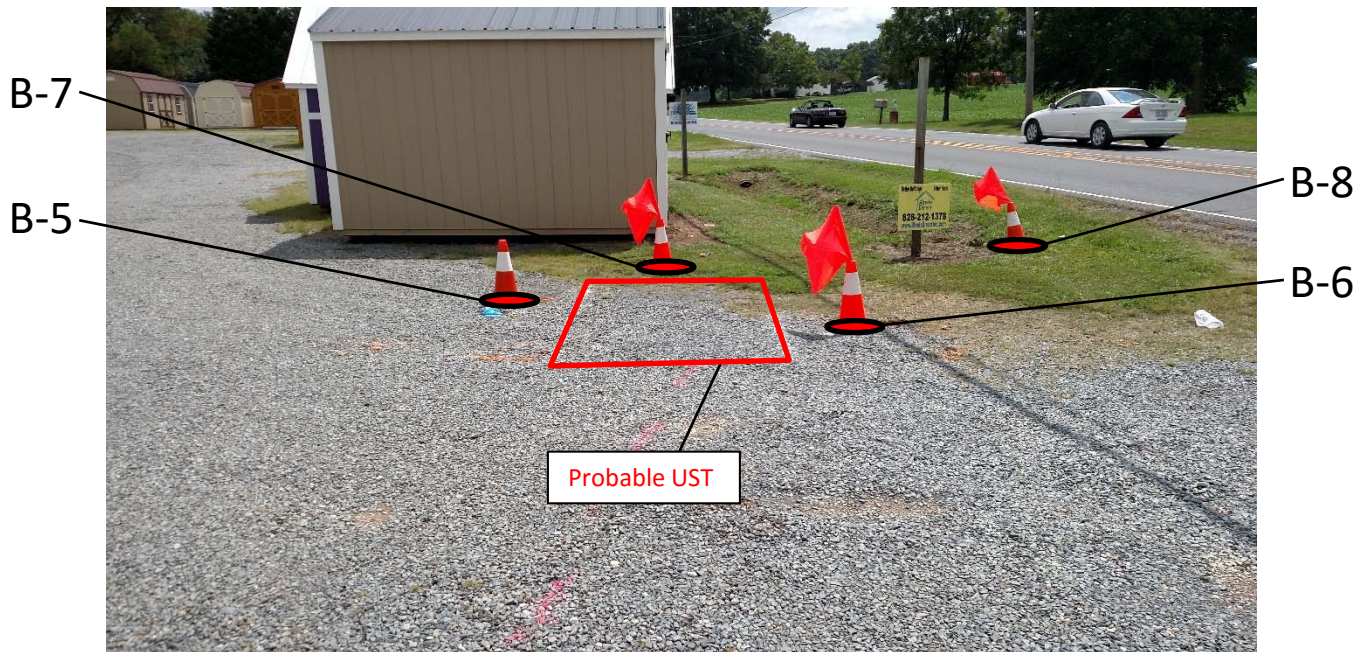


Photo #3: Boring locations B-5 through B-8, and a probable UST located southeast of the automotive detail shop, facing west.

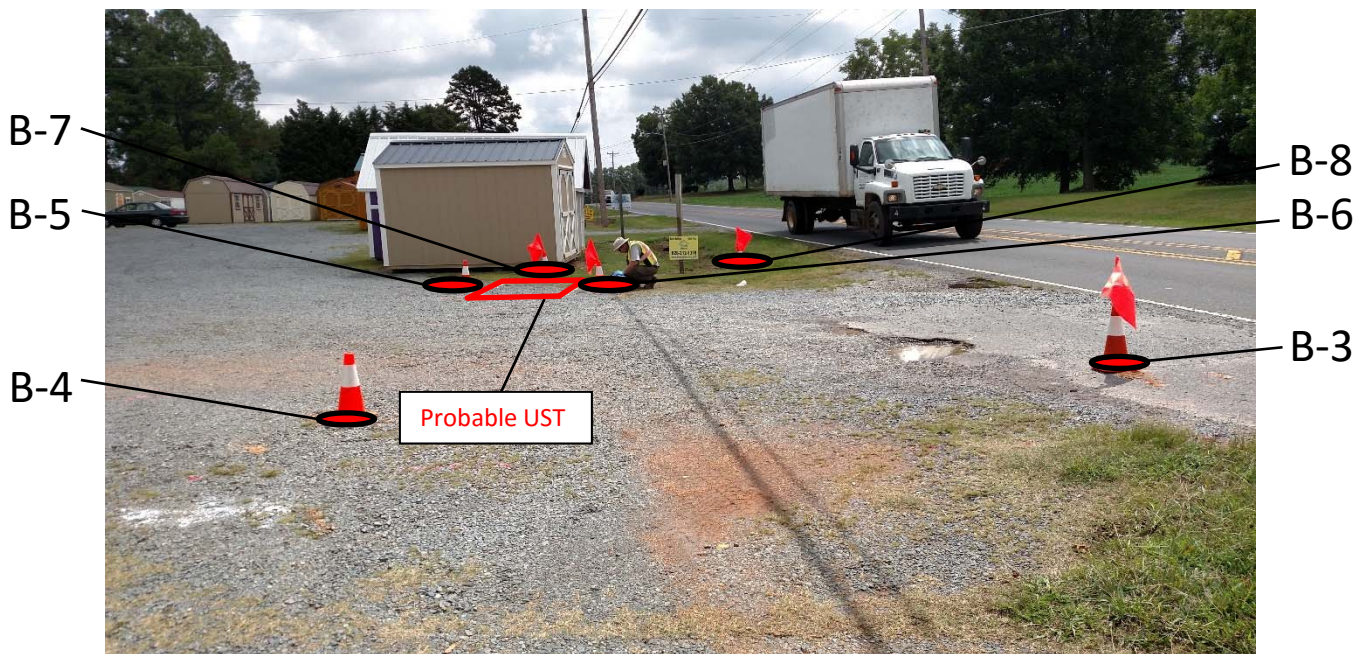


Photo #4: Boring locations B-3 through B-8, and a probable UST located southeast of the automotive detail shop, facing west.



APPENDIX IV

GEOPROBE LOGS



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-1 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 6.5'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Red Brown Silty Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Moist Red Brown Silty Clay with Stone	2.0	3.6	
			4.0	5.0	
	6.5	Geoprobe Boring Terminated by Direct Push Refusal at 3 feet.	6.5	4.3	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-2 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 7.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Red Orange Silty Clay			One sample collected for laboratory analysis (6.0-7.0) No petroleum odors observed.
	2.0		2.0	4.2	
	4.0		4.0	4.8	
	6.0	Moist Tan Red Silty Clay with Stone	6.0	4.5	
	7.0	Geoprobe Boring Terminated by Direct Push Refusal at 7 feet.	7.0	5.4	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-3 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 8.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	2.0	Moist Red Orange Silty Clay	2.0	4.4	One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	4.0	Moist to Dry Red Orange Silty Clay	4.0	4.7	
	6.0		6.0	3.0	
	8.0	Geoprobe Boring Terminated by Direct Push Refusal at 8 feet.	8.0	3.6	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-4 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 8.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Orange Red Silty Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Dry to Moist Brown Silty Clay	2.0	5.1	
	4.0		4.0	5.8	
	6.0		6.0	4.0	
	8.0	Geoprobe Boring Terminated by Direct Push Refusal at 8 feet.	8.0	3.6	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-5 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 8.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	2.0	Dry Red Brown Silty Clay	2.0	4.2	One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	4.0	Dry Brown Silty Clay	4.0	4.5	
	6.0	Dry Tan Silt with Stone	6.0	3.8	
	8.0	Geoprobe Boring Terminated by Direct Push Refusal at 8 feet.	8.0	4.0	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-6 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 6.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/01

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry Silty Clay with Stone			One sample collected for laboratory analysis (4.0-6.0) No petroleum odors observed.
	2.0		2.0	3.3	
	4.0		4.0	3.8	
	6.0	Geoprobe Boring Terminated by Direct Push Refusal at 6 feet.	6.0	1.0	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-7 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 7.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry Brown Silty Clay with Stone			One sample collected for laboratory analysis (6.0-7.0) No petroleum odors observed.
	2.0		2.0	3.8	
	4.0		4.0	4.4	
	6.0		6.0	3.0	
	7.0	Geoprobe Boring Terminated by Direct Push Refusal at 7 feet.	7.0	3.9	



FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P056 B-8 (1 of 1)

Project No: 66V-0092

Client: NCDOT

Project: R2530B PSAs

City/State: ALBEMARLE, NC

Elevation: EXISTING

Total Depth: 10.0'

Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH

Hammer Type: Automatic

Date Drilled: 8/15/17

Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Red Gray Silty Clay			One sample collected for laboratory analysis (6.0-8.0) No petroleum odors observed.
	2.0		2.0	3.4	
	4.0		4.0	4.2	
	6.0	Dry Red Brown Silty Clay	6.0	4.0	
	8.0	Moist Red Brown Silty Clay	8.0	4.8	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	3.8	



APPENDIX V

LABORATORY ANALYTICAL RESULTS



Hydrocarbon Analysis Results

Client: F&R
Address: 310 HUBERT ST
RALEIGH NC

Samples taken
Samples extracted
Samples analysed

Tuesday, August 15, 2017
Tuesday, August 15, 2017
Friday, August 18, 2017

Contact: BEN WHITLEY

Operator

NICK HENDRIX

Project: NCDOT-R2530B-P056

H09382

Matrix	Sample ID	Dilution used	BTX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P056-B1(2-4)	14.1	<0.35	<0.35	<0.35	<0.35	<0.07	<0.11	<0.014	0	100	0	(FCM)
s	P056-B2 (6-7)	41.9	<1	<1	<1	<1	<0.21	<0.34	<0.042	0	0	0	PHC not detected,(BO)
s	P056-B3 (2-4)	20.6	<0.51	<0.51	<0.51	<0.51	<0.1	<0.16	<0.021	0	0	0	PHC not detected
s	P056-B4 (2-4)	23.0	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	0	0	PHC not detected,(P)
s	P056-B5(2-4)	21.2	<0.53	<0.53	<0.53	<0.53	<0.11	<0.17	<0.021	0	0	0	PHC not detected
s	P056-B6 (4-6)	21.5	<0.54	<0.54	<0.54	<0.54	<0.11	<0.17	<0.022	0	100	0	PHC not detected
s	P056-B7 (6-7)	23.7	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.024	0	0	0	PHC not detected
s	P056-B8 (6-8)	11.0	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	60	40	Residual HC,(BO),(P)

Initial Calibrator QC check OK

Final FCM QC Check OK

99.6 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only.

Data generated by HC-1 Analyser

